

PRELIMINARY
KNKT.14.02.04.04

NATIONAL TRANSPORTATION SAFETY COMMITTEE

Aircraft Accident Investigation Report

**PT. Lion Mentari Air (Lion Air)
Boeing 737 – 900ER; PK-LFH
Juanda Airport, East Java
Republic of Indonesia
01 February 2014**



NATIONAL TRANSPORTATION SAFETY COMMITTEE
MINISTRY OF TRANSPORTATION
REPUBLIC OF INDONESIA
2014

This Preliminary report was produced by the National Transportation Safety Committee (NTSC), 3rd Floor Ministry of Transportation, Jalan Medan Merdeka Timur No. 5 Jakarta 10110, INDONESIA.

The report is based upon the investigation carried out by the NTSC in accordance with Annex 13 to the Convention on International Civil Aviation Organization, the Indonesian Aviation Act (UU No. 1/2009) and Government Regulation (PP No. 62/2013).

The preliminary report consists of factual information collected until the preliminary report published. This report will not include analysis and conclusion.

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When the NTSC makes recommendations as a result of its investigations or research, safety is its primary consideration.

However, the NTSC fully recognizes that the implementation of recommendations arising from its investigations will in some cases incur a cost to the industry.

Readers should note that the information in NTSC reports and recommendations is provided to promote aviation safety. In no case is it intended to imply blame or liability.

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ABBREVIATIONS AND DEFINITIONS

ABP	:	Able Bodied Passenger
AGL	:	Above Ground Level
AOC	:	Air Operator Certificate
ARFF	:	Airport Rescue and Fire Fighting
ATC	:	Air Traffic Control
ATIS	:	Aerodrome Terminal Information Services
ATPL	:	Air Transport Pilot License
ATS	:	Air Traffic Service
BMKG	:	<i>Badan Meterologi Klimatologi dan Geofisika</i> (Metrological Climatology and Geophysical Agency)
°C	:	Degrees Celsius
CAM	:	Cockpit Area Microphone
CASR	:	Civil Aviation Safety Regulation
CB	:	Cumulonimbus
CCTV	:	Closed Circuit Television
CPL	:	Commercial Pilot License
CSN	:	Cycles Since New
CVR	:	Cockpit Voice Recorder
DGCA	:	Directorate General of Civil Aviation
DH	:	Decision Height
DME	:	Distance Measuring Equipment
DMI	:	Deferred Maintenance Item
EGPWS	:	Enhance Ground Proximity Warning System
FAC	:	Flight Attendant Certificate
FDR	:	Flight Data Recorder
FL	:	Flight Level
FMC	:	Flight Management Computer
ft	:	Feet
hPa	:	Hectopascals
Hrs	:	Hours
ICAO	:	International Civil Aviation Organization
IFR	:	Instrument Flight Rules
IIC	:	Investigator in Charge
In Hg	:	Inch Hydrargyrum
Kg	:	Kilogram(s)
Km	:	Kilometer(s)
kts	:	Knots (nm/hours)
mbs	:	Millibars

MDA	:	Minimum Descend Altitude
mHz	:	Mega Hertz
Mm	:	Millimeter(s)
MTOW	:	Maximum Take-off Weight
NDB	:	Non Directional Beacon
Nm	:	Nautical mile(s)
NOTAM	:	Notice to Airman
NTSB	:	National Transport Safety Board
KNKT (NTSC)	:	<i>Komite Nasional Keselamatan Transportasi</i> (National Transportation Safety Committee)
P/A	:	Passenger Address
PAPI	:	Precision Approach Path Indicator
PF	:	Pilot Flying
PIC	:	Pilot in Command
PM	:	Pilot Monitoring
QFE	:	Height above airport elevation (or runway threshold elevation) based on local station pressure
QNH	:	Height above mean sea level based on local station pressure
SAR	:	Search and Rescue
S/N	:	Serial Number
SSCVR	:	Solid State Cockpit Voice Recorder
TAC	:	Temporary Airmen Certificate
TCAS	:	Traffic Collision Avoidance System
TSN	:	Time since New
TT/TD	:	Ambient Temperature/Dew Point
UTC	:	Universal Time Coordinate
VOR	:	Very High Frequency Omnidirectional Range

INTRODUCTION

SYNOPSIS

On 1 February 2014 a Boeing 737-900 registration PK – LFH flight no JT 361 operated by Lion Air as a passenger on flight from Sepinggan International Airport of Balikpapan to Juanda International Airport of Surabaya

The aircraft departed from Sepinggan International Airport (WALL) Balikpapan, at 1655 UTC¹ to Juanda International Airport (WARR) Surabaya East Java.

The Pilot in Command (PIC) acted as the Pilot Monitoring (PM) and the Second in Command (SIC) acted as the Pilot Flying (PF).

The occurrence flight was the second sectors of the crew and the aircraft on that day. The first sector was from Sepinggan International Airport to Juanda International Airport.

The pilot reported that the Auto Pilot disconnected at 1000 feet, wind from ATC 270/16 Knots.

At 1719 UTC the aircraft landed at Juanda Internatioanal Airport used runway 28.

After the first aircraft touched down, the aircraft experienced series of bounced landing and aircraft tail skid indicator touched the runway. The last touched down resulted 3.866 G

There were 225 persons on board. Two passengers suffered serious injuries and three passengers suffered minor injuries.

The passenger disembarked normally and the injured passengers evacuated to the polyclinic of the airport, by Lion ground services.

Further inspection found that nose wheel hub broken, one main tire flat and tail skid damage, left lower fuselage Section 43 Sta 500G - Sta 500H Stringer 21L wrinkle and right middle to upper fuselage from Section 43 - Section 46 wrinkle.

¹ The 24-hour clock used in this report to describe the time of day as specific events occurred is in Coordinated Universal Time (UTC). Local time for Surabaya is Waktu Indonesia Barat (WIB) is UTC + 7 hours.

1 FACTUAL INFORMATION

1.1 History of the Flight

On 1 February 2014 a Boeing 737-900 registration PK – LFH flight no JT 361 operated by Lion Air as a passenger on flight from Sepinggan International Airport of Balikpapan to Juanda International Airport of Surabaya

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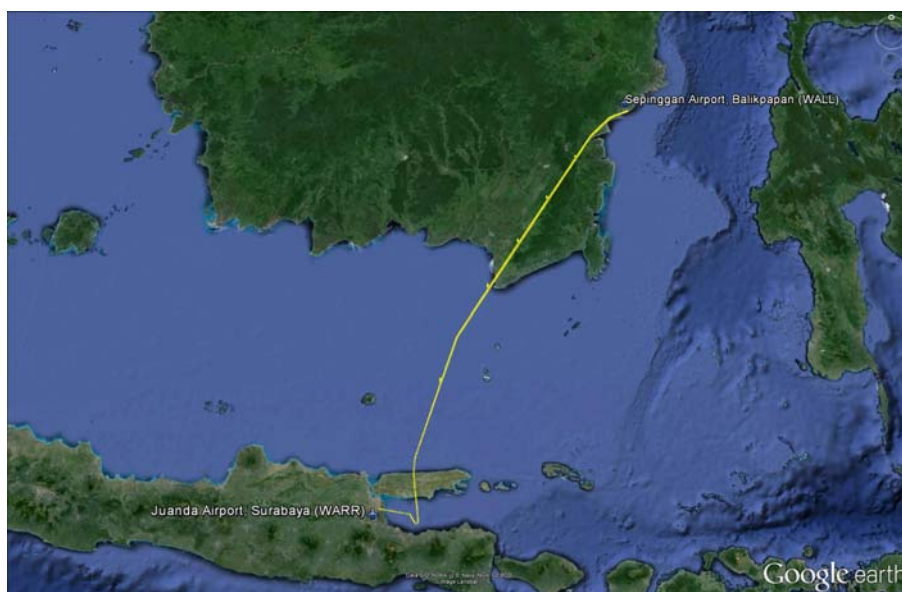
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The day before occurrence there was pilot report on aircraft flight maintenance log page 877033 reported that after hydraulic pump on, steering, elevator control movement feel to light and the maintenance corrective action taken was perform general checked elevator feel and centering unit, cleaned electrical plug carried out (ref. 27-31-64-200-801).

² The 24-hour clock used in this report to describe the time of day as specific events occurred is in Coordinated Universal Time (UTC). Local time for Surabaya is Waktu Indonesia Barat (WIB) is UTC + 7 hours.



Map courtesy of Google Earth

Figure 1. Map Sepinggan Airport towards Juanda Airport

1.2 Injuries to Persons

Injuries	Flight crew	Passengers	Total in Aircraft	Others
Fatal	-	-	-	-
Serious	-	2	2	-
Minor/None	7	213	220	Not applicable
TOTAL	7	215	222	-

The second in command was an India citizen.

1.3 Damage to Aircraft

The aircraft was substantially damaged, with the following condition; the nose wheel hub broken, one main tire flat and tail skid damage, left lower fuselage Section 43 Sta 500G - Sta 500H Stringer 21L wrinkle and right middle to upper fuselage from Section 43 - Section 46 wrinkle.



Figure 2. The right aircraft skin wrinkle

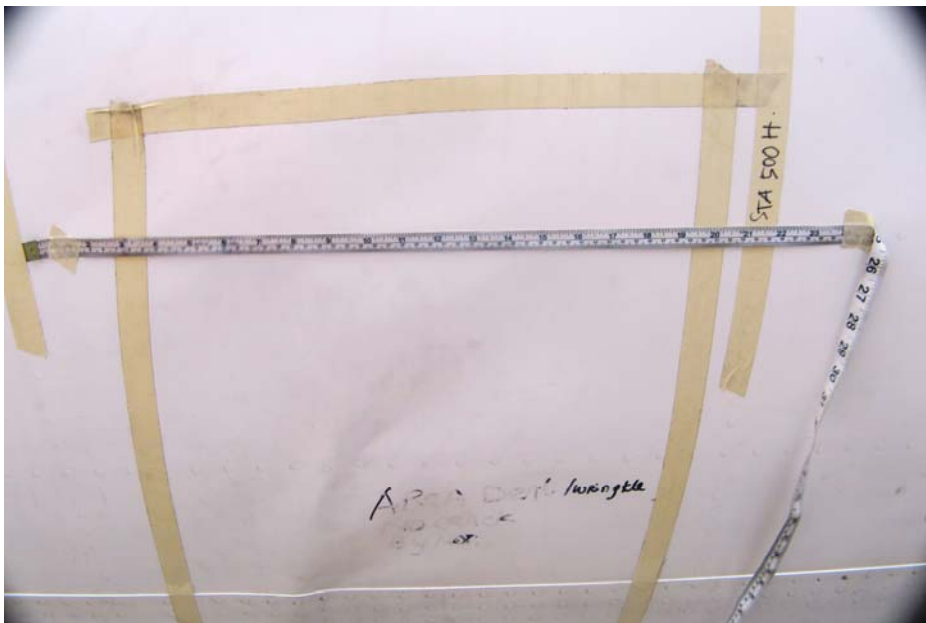


Figure 3. The aircraft skin wrinkle



Figure 4. The Left aircraft skin wrinkle



Figure 5. The right aircraft skin wrinkle



Figure 6: Tail skid indicator

1.4 Personnel Information

Pilot in Command

Gender	: Male
Age	: 33 years
Nationality	: Indonesian
Marital status	: Married
Date of joining company	: 23 April 2013
License	: ATPL
Date of issue	: 04 October 2013
Aircraft type rating	: CASA-212 & B737-NG
Instrument rating	: 30 September 2013
Medical certificate	: 24 November 2013
Last of medical	: 24 November 2013
Validity	: 24 April 2014
Medical limitation	: 24 April 2014
Last line check	: 24 December 2014
Last proficiency check	: 26 September 2013

Flying experience

Total hours : 3700 Hours
Total on type : 1300 Hours
Last 90 days : 236 : 10 Hours
Last 60 days : 200 : 00 Hours
Last 24 hours : 03 : 00 Hours
This flight : 01 : 20 Hours

Second in Command

Gender : Male
Age : 24 Hours
Nationality : India
Marital status : Single
Date of joining company :
License : 3443263
 Date of issue : 04 September 2011
 Validity : 30 Augustus 2014
 Aircraft type rating : B737 NG
Instrument rating :
Medical certificate : 31 October 2013
 Last of medical : 31 October 2013
 Validity : 31 April 2014
 Medical limitation : 31 April 2014
Last line check : 24 October 2013
Last proficiency check : 17 Augustus 2013

Flying experience

Total hours : 1000 Hours
Total on type : 750 Hours
Last 90 days : 193 : 35 Hours
Last 60 days : 104 : 05 Hours
Last 24 hours : 03 : 00 Hours
This flight : 01 : 20 Hours

Both of the pilots did not get Bounced landing recovery and rejected landing training exercise.

1.5 Aircraft Information

1.5.1 general

Registration Mark	: PK-LFH
Manufacturer	: Boeing
Country of Manufacturer	: Boeing USA
Type/ Model	: Boeing 737-900ER
Serial Number	: 35710
Year of manufacture	: 12 June 2007
Certificate of Airworthiness	
Issued	: 12 June 2013
Validity	: 11 June 2014
Category	: Transport
Limitations	: None
Certificate of Registration	
Number	: PK-LFH
Issued	: 12 June 2013
Validity	: 11 June 2014
Time Since New	: 21840 : 22
Cycles Since New	: 15243
Last Major Check	: P.24
Last Minor Check	: P.28

1.5.2. Engines

Manufacturer	: Boeing
Type/Model	: CMF56-7B26/3
Serial Number-1 engine	: 894679
▪ Time Since New	: 21840 : 22
▪ Cycles Since New	: 15243
▪ Installed	: 10 May 2007
Serial Number-2 engine	: 894669
▪ Time Since New	: 19803 : 47
▪ Cycles Since New	: 15243
▪ Installed	: 29 March 2013

There was pilot report on aircraft flight maintenance log page 877033 dated 31 January 2014 reported that after hydraulic pump on, steering, elevator control movement feel to light and the maintenance corrective action taken was perform general checked elevator feel and centering unit, cleaned electrical plug carried out (ref. 27-31-64-200-801).

The inspection performed by Operator maintenance team supervised by NTSC on 22 February 2014, at Juanda Airport of Sidoarjo, referred to the AMM Task 27-31-00-700-809.

Tool to be used in this functional check was push pull guage part no. LG-050 serial number R05971 calibrated valid until July 02 2014.

The functional check of the elevator control artificial feel on the specified aircraft were as follows :

Up force position

Up Force	Test 1	Test 2	Test 3	Limitation
19.5 lbf	3,6 inches	3,8 inches	3,7 inches	1.9 – 2 inches
21 lbf	5.8 inches	8.2 inches	7.9 inches	5.05 – 5.15 inches
29.5 lbf	10.2 inches	11.2 inches	10.5 inches	9.4 – 9.5 inches

Down force position

Down Force	Test 1	Test 2	Test 3	Limitation
17.5 lbf	3,5 inches	3,8 inches	3,7 inches	1.9 – 2 inches
28 lbf	10.8 inches	11.5 inches	11.7 inches	5.05 – 5.15 inches
34.8 lbf	11.5 inches	11.8 inches	12.5 inches	9.4 – 9.5 inches
Down Force	Test 1	Test 2	Test 3	Limitation

1.6 Meteorological Information

The weather data was issued by the Badan Meteorologi Klimatologi dan Geofisika (BMKG), with the weather observation being performed ten minutes prior to the issuance. Weather Report for Juanda International Airport, issued 01 February 2014, at 0300-0400 UTC as follows:

	0300 UTC	0330 UTC	0400 UTC
Wind	180° / 15 knots	290° / 17 knots	280° / 18 knots
Visibility	18 km	18 km	18 km
Weather	NIL	NIL	NIL
Cloud	Broken 1,800 ft	Broken 1,800 ft	Broken 1,800 ft
Temp/Dew point	30° C / 23° C	30° C / 22° C	30° C / 22° C
QNH	1008 mb	1008 mb	1008 mb

1.7 Aids to Navigation

Ground-based navigation aids / onboard navigation aids / aerodrome visual ground aids and their serviceability were not a factor in this occurrence.

1.8 Communications

All communications between Air Traffic Services (ATS) and the crew were recorded by ground based automatic voice recording equipment and Cockpit Voice Recorder (CVR) for the duration of the flight. The quality of the recorded transmissions was good.

1.9 Aerodrome Information

Airport Name	: Juanda Int'l Airport
Airport Identification	: WARR/SUB
Airport Operator	: PT. Angkasa Pura I (Persero)
Airport Certificate	: Category VIII
Coordinate	: 07°22'51"S 112°47'11"E
Elevation	: 9 Feet
Runway Direction	: 10 - 28 / 097° - 277°
Runway Length	: 3,000 meters
Runway Width	: 45 meters
Surface	: Asphalt

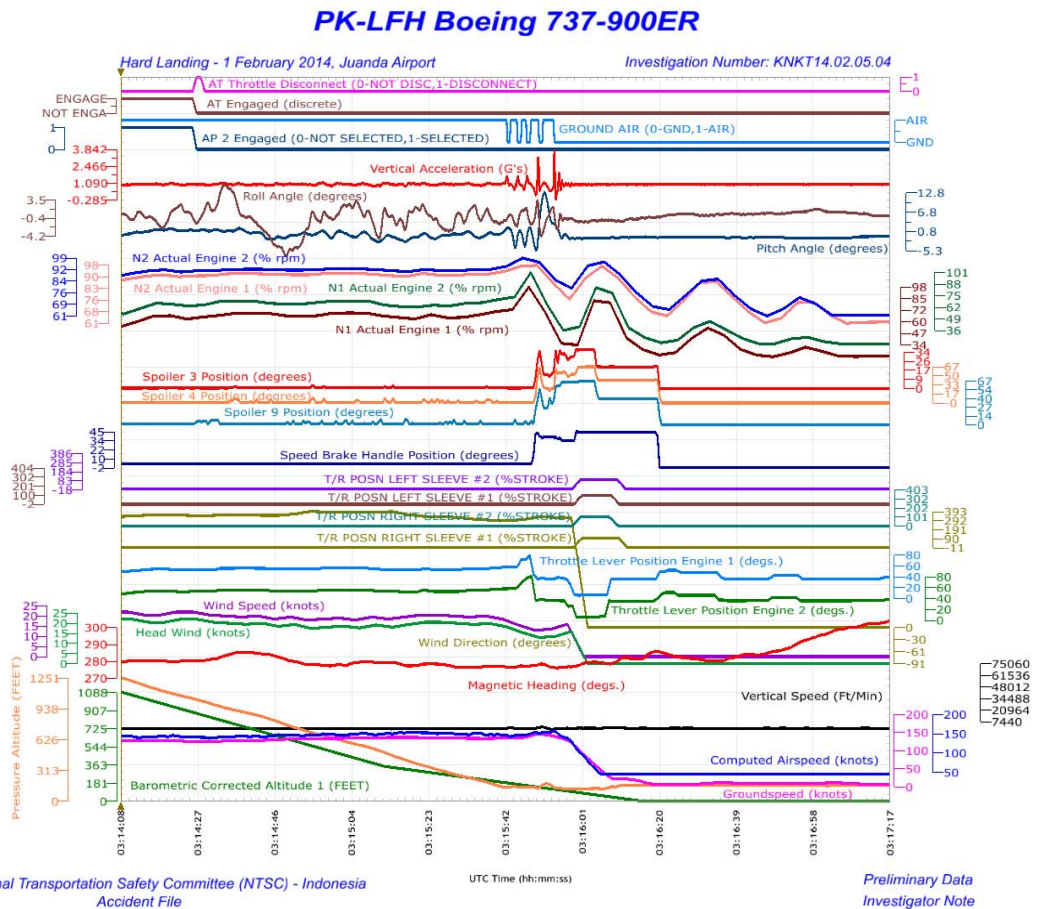
1.10 Flight Recorders

The aircraft was equipped with a Honeywell solid state flight data recorder. The FDR and CVR were received at the NTSC recorder laboratory on 05 February 2014 received in good condition.

The details of the FDR were:

- a) Manufacturer : Honeywell
- b) Part Number : 980-4700-042
- c) Serial Number : SSFDR-14293

The FDR downloaded successfully in NTSC facility



The details of the CVR were:

- a) Manufacturer : Honeywell
- b) Part Number : 980-6022-001
- c) Serial Number : CVR 120-09634

The record of CVR was in a good quality voice recorded.

1.11 Wreckage and Impact Information

The aircraft had experienced of five time bounced and hard landing of 3.866 G and taxied to parking stand, all the aircraft parts were still intact with the following condition of the nose wheel hub broken, one main tire flat and tail skid damage, left lower fuselage Section 43 Sta 500G - Sta 500H Stringer 21L wrinkle and right middle to upper fuselage from

1.12 Medical and Pathological Information

No medical or pathological investigations were conducted as a result of this occurrence, nor were they required.

1.13 Fire

There was no evidence of fire prior and post impact

1.14 Survival Aspects

The evacuation of passenger perform by Lion ground services and the injure passengers evacuated to the policlinic of the airport.

The injured passengers were on the seat configuration Seat numbers 38 F Nong Somchai, 2. 37 E Roesmiati , 3. 36 D Sriati M, 4. 38 D Wardining sih, 5. 34 C Suratmi,

1.15 Tests and Research

1.16 Organizational and Management Information

Aircraft Owner	:	AVIATION LEASING OPCO 2 SARL
Address	:	2, Rue Heinrich Heine 1720 Luxemburg
Aircraft Operator	:	PT. Lion Mentari Airlines
Address	:	Jalan Gajah Mada No. 7 Jakarta Pusat, Republic of Indonesia
Operator Certificate Number	:	AOC/121-010

1.16.1 Company Operation Manual

Company Operation Manual (COM) Chapter 4: Operation Directive: 4.10.1.12. Less Experienced Pilot.

General

Chief Pilot/Fleet Manager on type must make sure that all pilots are aware of the limitations of less experience pilots, and that policy must be understood by all Pilots.

The exception those conditions stated below, is when the PIC is a qualified Flight Instructor airplane.

- 1. Second In Command (SIC) is only allowed to become a Pilot Flying (PF) after reaching a 300 flight hours on the aircraft type flown (on type)*
- 2. SIC with more than 300 flight hours on type, may become the PF on takeoff, but to become the PF for landing, he/she restricted to approach using an instrument landing system (ILS).*
- 3. Especially for Boeing 737-900 ER, with the degree of difficulties because the length of the aircraft, SIC may become a PF after reaching 500 flight hours on type.*
- 4. An extreme caution must be exercised anytime flying with less experienced pilot. The PIC must be prepared to take over the flight control, especially during takeoff and landing when the SIC is the PF. PIC must keep soft touch on rudder pedal, control column and thrust levers.*
- 5. When the PIC has less than 300 flight hours on type. The PIC is not allowed to entrust the control to the SIC, irrespective of the SIC total flight time on type.*
- 6. At all special airports and or when following condition exist (s) PIC always the PF*
 - The prevailing visibility value in the latest weather report for the airport is at or below 1 kilometer.*
 - The runway visual range (if reported) for the runway to be use is at or below 1,500 meters*
 - The runway to be used has water, snow, slush or similar condition that may adversely affect airplane performance.*
 - The braking action of the runway to be used is reported to be less then “good”. The cross wind component for the runway to be used in excess of 15 knots*
 - Wind shear is reported in the vicinity of the airport.*
 - Any other condition in which the PIC determines is to be prudent to exercise the PIC prerogative.*
 - Approach and landing on Non Precision Approach (NPA) runway.*

Note: for captaincy training purposes a PIC left seat Pilot may exercise the duty of PF.

1.17 Additional Information

1.18 Useful or Effective Investigation Techniques

The investigation was conducted in accordance with the NTSC approved policies and procedures, and in accordance with the standards and recommended practices of Annex 13 to the Chicago Convention.

2 FINDINGS

According to factual information during the investigation, the National Transportation Safety Committee founded any initial findings as follows:

To be included on the report

3 SAFETY ACTION

At the time of issuing this preliminary report, the National Transportation Safety Committee had not been informed of any safety actions resulting from this occurrence.

4 SAFETY RECOMMENDATIONS

According to factual information and initial findings, the National Transportation Safety Committee issued safety recommendations to address several safety issues identified. Such as, bounced landing, crew pairing and elevator control artificial feel trouble in this preliminary report .

Therefore the NTSC recommends PT. Lion Mentari Air shall review:

- The implementation the bounced landing recovery and rejected landing training exercise.
- That the pairing of less experience pilot and the limitations were met to the COM chapter 4 Operation
- The issue of the elevator control artificial feel deviation value found from the accident aircraft did not occur on the other similar type of aircraft.

5 APPENDICES

The injured passengers seating

Seat no 38 F Nong Somchai, 2. 37 E Roesmiati , 3. 36 D Sriati M, 4. 38 D Wardining sih, 5. 34 C Suratmi.



Figure 7. The injured passenger seating